

National Aeronautics and Space Administration



# **MENTOR HANDBOOK**

## **FOR GSFC INTERNSHIPS**

**Office of Higher Education, Mail Code 602  
NASA Goddard Space Flight Center  
Greenbelt, MD 20771  
<http://academy.gsfc.nasa.gov/>**





Official NASA Seal

**The NASA Vision:**

- To improve life here,
- To extend life to there,
- To find life beyond

***NASA Mission Statement:***

- *To understand and protect our home planet*
- *To explore the Universe and search for life*
- *To inspire the next generation of explorers  
... as only NASA can."*

## PREFACE

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This handbook contains information for Goddard mentors, attempts to summarize aspects common to successful mentoring relationships, and suggests basic mentoring/host guidelines to Goddard scientists and engineers who agree to host and guide participants in their resident part-time research work.

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## **1. ORGANIZATION AND MANAGEMENT**

### **1.1 FINANCIAL SUPPORT**

Goddard internships are financially supported by the NASA GSFC Office of Higher Education and other NASA and non-NASA organizations. Participants are sponsored by the US regional Space Grant Consortia.

### **1.2 ORGANIZATION**

Goddard internships are administered and operated within the GSFC Office of Higher Education.

#### Chief, University Programs - Dr. Vigdor L. Teplitz

Dr. Teplitz directs the Office of Higher Education and provides vision, inspiration, and leadership for the Academy and other programs offered by the Office. He joined Goddard at the beginning of 2003 on a three-year leave of absence from the Physics Department of Southern Methodist University. His previous experience includes academic appointments at MIT and Virginia Tech, as well as twelve years in the U.S. Arms Control and Disarmament Agency and two years in the White House Science Office. His research is in elementary particle theory, primarily at its border with astrophysics and cosmology.

#### Co-Director, University Programs - Dr. Richard P. Fahey

Dr. Fahey serves as Deputy Chief of the Office of Higher Education. Prior to Dr. Teplitz's arrival, he led the Office of Higher Education as Acting Director for several years both before and after Jerry Soffen's death. For the past three decades, he has been developing methods of presenting aspects of relativity and quantum theory to specialist and non-specialist audiences. During that time, he has taught courses in physics, astronomy, relativity and cosmology, aerospace engineering, and the philosophy of nature. Dr. Fahey currently conducts research in cosmology and gravitational wave detection at GSFC. He also holds the Naval Space Command Research Chair at the U.S. Naval Academy in Annapolis.

Program and IT Support - Mr. Johnny Erickson

Johnny has a B.S. in Computer Science and is the co-founder of a software design company. He oversees and manages the entire on-line system of applications and program endorsements for all High Education internships.

Additionally, resident staff members typically provide general assistance and logistics coordination for most programs. They reside full time with students and are available as facilitators in all relevant program activities.

A more comprehensive list of Higher Education personnel appears in Appendix II.

All members of the Office of Higher Education are pleased to grant any additional assistance and support.

## **2. THE ROLE OF MENTORS, HOSTS, AND SUPERVISORS**

In a relatively short time, by observing the mentors and their associates at work, mingling with the larger NASA scientific community, and lending a hand in the real work of NASA laboratories, students acquire professional skills and work habits that shape in unpredictable ways their professional development into the future scientists and leaders of the space program.

Often, students' mentors are the best teachers they have ever had. Additionally, mentors cultivate valuable coaching, feedback, and leadership skills that can further their own personal and professional development. When viewed as an enabling process that facilitates career development and skills exchange, mentoring brings satisfaction and benefit to all parties involved. Professional mentor-mentee relationships may evolve into natural friendships and former students may become colleagues.

Effective mentoring need not always require large amounts of interaction time. Students augment their knowledge and experience in a variety of circumstances and with a variety of tools. Often, merely "shadowing" the experts is beneficial. Moreover, the ethical, scientific, and professional behavior of mentors and collaborators, as well as their attitude toward work, leave a strong impression on students.

The roles of the mentor may include coaching, teaching, motivating, counseling, guiding, opening doors, advising, sponsoring, and most importantly being a role model.

As a mentor, you should expect your student to be competent, ambitious, eager to learn, loyal, hardworking, and candid; have a positive attitude; and be able to listen, work as partners, and accept responsibilities.

### 3. BASIC MENTORSHIP GUIDELINES

- The mentors (Principal Investigators at GSFC or their designated substitutes) are invited to attend the First Day Orientation Meeting at which participants are introduced to their respective mentors.
- After the meeting, mentors escort their students to the host laboratories, introduce them to the local team members and collaborators, discuss the work assigned to them for the entire length of their summer residence at GSFC, and orient them regarding the location of the buildings, rooms, installations and facilities related to the students' work.
- It is essential that student interns are provided with:
  - Dedicated desk space
  - Access to telephone
  - Access to computer
  - Access to printer
  - Access to Internet connection
- If shop work or data processing and use of specific software are involved in the assigned duties, it is important that the students are initiated in such operations, know the computer passwords, the location of necessary stockroom materials, and the technical personnel whom they may need to contact in order to execute and complete the assigned tasks, thus avoiding or minimizing any possible waste of time or idle presence in the labs.
- The GSFC mentors should be aware of the time schedule of their students. For example, the NASA and Robotics Academies are based on an intensive daily schedule, with more than three full days (Monday through Wednesday) of each week working on their research projects, but also include off-site time on field trips or other activities (see additional section on NASA and Robotics Academies).
- Although most students possess basic skills, it is important that the mentors or their designated substitutes are available to guide them, answer their questions and supervise their work as needed. Equally important is that students be involved in challenging and intense learning/training work.

- Students are instructed at orientation on the general rules and constraints valid within the NASA-GSFC perimeters including: security, driving speeds, parking, restricted access to buildings and facilities, etc. No discipline incidents are expected to occur. However, the staff appreciate the cooperation of the mentors in sharing the responsibility for the smooth and successful unfolding of the summer for interns at GSFC.

## **4. CONDUCT, GRIEVANCES, & GROUNDS FOR STUDENT DISMISSAL**

### **4.1 CODE OF CONDUCT**

All Goddard interns and staff shall conduct themselves in a manner honorable and respectful toward each other and the institutions with which they interact at all times, places and circumstances in which the internship activities are conducted.

Any harassment or discrimination against any of the Goddard community, its partners, hosts, or other interns is strictly prohibited and will not be tolerated.

Participants should understand the professional pressures and time constraints faced by their mentors. For NASA scientists and engineers, mentoring is not their primary responsibility; in fact, the time spent with interns can be time taken from their own research.

Participants will inform mentors in advance, as early as possible, of any schedule changes decided by their program staff, or unplanned absences due to illness or other unpredicted circumstances.

### **4.2 GRIEVANCE PROCEDURES**

Principal Investigators are encouraged to raise any issues of concern involving their student. More serious academic problems should be directed to the program's Academic Dean (if applicable) and any other problems to the Program Manager. Further appropriate actions will be taken by Dr. Richard P. Fahey and/or Dr. Richard C. Henry and the Chief of Office of Higher Education (Dr. Vigdor Teplitz).

Actions taken will be decided by program staff, and will range from mediation to dismissal of the participant involved.

Full confidentiality will be respected if requested. Lodging a grievance shall not affect negatively the individual who initiated the grievance event.

### **4.3 GROUNDS FOR DISMISSAL**

A NASA-Goddard intern must act professionally and maintain amiable conduct in at all times. The following is a list of disruptions or violations, which can lead to dismissal:

- Providing misleading or false information on the application
- Inappropriate use of government facilities
- Actions disruptive to the group during activities or at the house
- Unprofessional conduct in the lab, or during group activities (speakers, tours, trips, outreach activities)
- Lack of respect of Principal Investigators, staff, speakers, and fellow students
- Failure to complete assigned tasks and deliverables
- Unexcused absences
- Other actions deemed inappropriate or disruptive by staff

**The following section contains information  
specific to PIs mentoring NASA Academy or  
Robotics Academy students**

## **5. NASA ACADEMY**

### **5.1 PROGRAM DESCRIPTION**

The NASA Academy is an intensive summer leadership program of higher learning for college undergraduate and graduate students interested in pursuing professional careers in space-related fields.

Designed to present a comprehensive package of information and experiences about NASA, the NASA Academy exposes its students (Research Associates, or RAs) to the agency's most important current and planned science, engineering, education, and technology enterprises. It also offers training in non-technical areas such as: management, budgeting, safety, personnel and career development, leadership, space law and international cooperation. Besides attending lectures and workshops, RAs are involved in supervised research in GSFC laboratories and participate in visits to NASA Headquarters, various NASA Centers and facilities, the Applied Physics Laboratory, and other space-related academic laboratories and industries.

The GSFC NASA Academy is coordinated with the University of Maryland at College Park's College of Computer, Mathematical, and Physical Sciences; A. James Clark School of Engineering, and the Department of Geography. As such, participants receive academic credit from the University.

### **5.2 OBJECTIVES**

The objectives of the NASA Academy at GSFC are

- To identify, encourage, and assist future leaders of the aerospace program
- To provide an opportunity for participants to contribute to research in a world-class, space-related laboratory
- To provide a unique, intensive educational training curriculum on NASA; its in-house science and technology projects; its collaboration with other National centers, industry, and academia; and its extensive technology-transfer programs
- To foster creativity, personal initiative, leadership, teamwork, appreciation for diversity, and professional ethics

### **5.3 ELIGIBILITY CRITERIA**

Selection of participants in the NASA Goddard Academy is based on the following criteria:

- Academic rank (undergraduate juniors - second year graduate students)
- Academic excellence (minimum 3.0 GPA)
- Demonstrated interest in space
- Demonstrated leadership
- Research or project experience
- Maturity
- Recommendation and references

Both the selection process and placement of the Academy participants in Goddard's research groups is assisted by recommendations from faculty, administrators, academic supervisors and co-workers, and the applicants' self-profiling essays.

Citizenship or permanent residence is required for US applicants.

### **5.4 PLACEMENT IN GSFC LABORATORIES**

The selected students are matched with their hosts in GSFC laboratories in advance of their arrival on-Center and based on expressed mutual interests.

### **5.5 DUTIES AND RESPONSIBILITIES**

To provide an insight into the NASA Academy, this Handbook includes a list of the principal duties and responsibilities of RAs, as follows:

- Work with assigned research supervisors on individual laboratory or field research projects
- Work together on the Group Project
- Attend all Academy functions (lectures, workshops, review sessions, field trips)
- Prepare and deliver Poster and Final Oral Presentations related to the individual and group project work executed during the Academy session

- Create mini-educational Internet modules related to their research.
- Create weekly Internet reports of the Academy activities, as components of the Goddard Academy Web Site
- Create the Goddard Academy Yearbook
- Create original patch, slogan and mascot for the NASA Goddard Academy
- Assist in the operation of the Academy, as needed

Halfway through the summer, RAs will organize a poster session. All mentors, co-workers, visitors, and other interested persons are invited to attend and entertain scientific dialogues with the student presenters. These conversations with and critique from scientists and experts are very valuable for the RAs, allowing them to demonstrate their communication skills, knowledge and familiarity with the project. RAs also benefit from any feedback that can be used in preparation for their final presentations held at the conclusion of the Academy.

At the final presentation and graduation ceremony, each RA will give a formal oral presentation of his/her research work at GSFC, followed by a presentation of the group project and awards ceremony. All GSFC mentors/supervisors are cordially invited to attend and evaluate these presentations. Academy mentors will also be recognized for their supervision and guidance.

## **6. ROBOTICS ACADEMY**

### **6.1 PROGRAM DESCRIPTION**

The Robotics Academy is an intensive summer program of higher learning for college undergraduate and graduate students interested in pursuing professional careers in the field of robotics. Designed to be a team experience, the Robotics Academy exposes its Research Teams (RTs) to the latest advances in robotics technology. Besides attending lectures and workshops, the RTs are involved in supervised research in GSFC or associate laboratories and participate in visits to various NASA Centers and facilities, and other robotics-related academic laboratories and industries.

### **6.2 OBJECTIVES**

The objectives of the Robotics Academy at GSFC are

- To identify, inspire, and develop future robotics specialists with emphasis on supporting Lunar Exploration and the 21st Century Explorer
- To provide an opportunity for participants to contribute to research in a world-class, robotics-related laboratory
- To provide a unique, intensive, and rigorous educational and training curriculum on NASA, its in-house robotics projects, its collaboration with other National centers, industry, and academia, and its extensive technology-transfer programs

### **6.3 ELIGIBILITY CRITERIA**

Selection of participants in the NASA Robotics Academy is based on the following criteria:

- Academic rank
  1. Rising undergraduate freshman and sophomores for Resident Associates
  2. Juniors – PhD students for Team Leads
- Academic excellence (minimum 3.0 GPA)
- Demonstrated interest in robotics
- Demonstrated leadership and ability to work in a team
- Research or project experience

- Maturity
- Recommendation and references

Both the selection process and placement of the Academy participants in Goddard's research groups is assisted by recommendations from faculty, administrators, academic supervisors and co-workers, and the applicants' self-profiling essays.

Citizenship or permanent residence is required for US applicants.

## **6.4 PLACEMENT IN GSFC LABORATORIES**

The selected students are assigned to their teams and are matched with their hosts in GSFC laboratories in advance of their arrival on-Center and based on expressed mutual interests.

## **6.5 DUTIES AND RESPONSIBILITIES**

To provide an insight into the Robotics Academy, this Handbook includes a list of the principal duties and responsibilities of RTs, as follows:

- Work with assigned research supervisors on research projects
- Work together on the Group Project
- Attend all Robotics Academy functions (lectures, workshops, review sessions, field trips)
- Prepare and deliver Poster and Final Oral Presentations related to the team and group project work executed during the Academy session
- Create weekly Internet reports of the Robotics Academy activities.
- Create the Goddard Robotics Academy Yearbook
- Create original "Logo", "Patch", and "Mascot" for the NASA Robotics Academy
- Assist in the operation of the Academy, as needed

Robotics Academy time outside the host laboratories is occupied with the Group Project, attendance of colloquia, seminars, or workshops, meetings with experts and leaders in the fields of space or robotics, and field trips or visits to local university laboratories and industries.

Halfway through the summer, there will be a Project Poster Session. All mentors, coworkers, visitors, and other interested persons are invited to attend and entertain scientific dialogs with the RTs. These conversations and critique from scientists and experts are very valuable for the students. They allow the teams to demonstrate their communication skills, knowledge, and familiarity with the project. They also benefit the teams by providing much needed feedback that can be used in the preparation for their final presentations held at the conclusion of the Academy.

At the final presentation and graduation ceremony, each team will give a formal oral presentation of their research work at GSFC, with each member highlighting their individual progress. This will be followed by the presentation of the group project and awards ceremony. All GSFC mentors/supervisors are cordially invited to attend and evaluate these presentations. The mentors will also be recognized for their supervision and mentoring work.

## MENTORING RESOURCES

1. M.W. Galbraith and N.H. Cohen, Eds., *Mentoring: New Strategies and Challenges*, Jossey-Bass, San Francisco, 1995.
2. H.E. Johnson. *Mentoring for Exceptional Performance*, Griffin Publishing, Beverly Hills, 1997.
3. M. Murray, *Beyond the Myths and Magic of Mentoring: How to Facilitate an Effective Mentoring Program*, Jossey-Bass Publishers, San Francisco, 1991.
4. G.F. Shea, *Mentoring: A Practical Guide*, Crisp Publications, Menlo Park, 1998.
5. M.Sinetar, *The Mentor's Spirit: Life Lessons on Leadership and the Art of Encouragement*, St.Martin's Press, New York, 1998.
6. S.G. Brainard and D.A. Harkins, "A Curriculum for Training Mentors and Mentees", WEPAN Western Regional Center, University of Washington, Seattle, WA, 1998.
7. N.A. Gaffney, Ed., "A Conversation about Mentorship: Trends and Models", Council of Graduate Schools, Washington DC, 1995.
8. K.E. Kram, "Mentoring at Work: Developmental Relationships in Organizational Life", *Organizational Behavior and Psychology Series*, H.J. Reitz, Ed., Scott, Foresman and Co., Glenview, IL, 1985.
9. M.A. Wunsch, Ed., "Mentoring Revisited: Making and Impact on Individuals and Institutions", *New Directions for Teaching and Learning*, 57, Spring 1994, Jossey-Bass Publishers, San Francisco, CA, 1994.
10. Mentoring Information at the Los Alamos National Laboratory:  
<http://education.lanl.gov/RESOURCES/mentors/Education.html>
11. Mentoring Information at the University of California at San Diego:  
<http://rcr.ucsd.edu/content/descriptions/mentoring.htm>

12. Mentoring Information at Penn State University  
<http://www.hhdev.psu.edu/careers/>
13. "Adviser, Teacher, Role Model, Friend: On Being a Mentor to Students in Science and Engineering", National Academy of Sciences, National Academy of Engineering, Institute of Medicine

Thank you, and enjoy your student coworkers and your mentoring opportunity!

## Appendix I: INTERNET RESOURCES

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- 5 NASA Academy:  
<http://www.nasa-academy.nasa.gov/>
- 6 NASA Academy Alumni Association:  
<http://www.nasa-academy.org/>
- 7 International Space University:  
<http://www.isunet.edu/>
- 8 The Soffen Memorial Fund  
<http://www.nasa-academy.org/soffen/donors.html>
- 9 Goddard Space Flight Center  
<http://www.gsfc.nasa.gov/>
- 10 Goddard Space Flight Center's Mission  
[http://www.gsfc.nasa.gov/about\\_mission.html](http://www.gsfc.nasa.gov/about_mission.html)
- 11 Office of Higher Education  
<http://university.gsfc.nasa.gov/>

## Appendix II: USEFUL CONTACTS

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Office of Higher Education Personnel (in alphabetic order):

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## NOTES

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